

Inclusive & Gender

Protecting Workers' Reproductive Health

By Morgan M. Bliss and Jacob Krzystowczyk

OSH professionals may experience an increased interest in and concerns about providing gender equal protection from their employer's management team, occupational

medicine providers and human resources partners. The protection of reproductive health for all genders must be ensured in the workplace. There have been significant changes to regulatory and legal aspects of gender equal protection in recent years (Pisko, 2016). International conversations have re-energized the discussion about providing inclusive and gender equal protection in the workplace.

In the U.S., state-based laws have generally been termed a Pregnant Workers Fairness Act (PWFA) or similarly named acts. As of November 2017, 22 states, the District of Columbia, and four municipalities have enacted PWFA legislation, in-

cluding: Alaska, California, Colorado, Connecticut, Delaware, Hawaii, Illinois, Louisiana, Maryland, Massachusetts, Minnesota, Nebraska, Nevada, New Jersey, New York, North Dakota, Rhode Island, Texas, Utah, Vermont, Washington and West Virginia (National Partnership for Women and Families, 2017). A PWFA has been proposed at the federal level (S.1512), but progress in pass-

ing the act is slow. Congress has "attempted multiple times to pass" the federal PWFA, but the law has been opposed by several sessions of Congress (Pisko, 2016).

Upcoming regulatory changes associated with revisions to EPA's Toxic Substances Control Act are also relevant. As part of the Frank R. Lautenberg Chemical Safety for the 21st Century Act (2016), a definition for "potentially exposed or susceptible subpopulation" has been established to include a group of individuals with greater risk than the general population for adverse health effects relating to chemical exposure. This greater risk is further explained to be either from greater susceptibility or greater exposure, and includes infants, children, pregnant women, workers and the elderly.

Lewandowski and Dodge (2016) provide a sobering statistic: "66% of women who gave birth to their first child between 2006 and 2008 worked during their pregnancy." In a section of their article that discusses occupational exposure limits (OELs) and evaluates developmental and reproductive toxicity effects, the authors state that it is "important to encourage workers to inform health and safety personnel of their pregnancy (or intended pregnancy) as early as possible" so that the "windows of susceptibility" for the fetus are sufficiently protected (Lewandowski & Dodge, 2016).

The challenges associated with this topic and the recent regulatory developments can create a problem for OSH professionals. If workers notify company OSH professionals or industrial hygienists about their (or their partner's) pregnancy or intent to conceive, would the OSH professional know

IN BRIEF

•Workers may express concerns to an OSH professional about reproductive and developmental health effects, prenatal exposure or exposure during breastfeeding.

•Little guidance on risk assessments for susceptible workers is available to practicing OSH professionals.

•Risk assessments for susceptible workers should be conducted as part of a comprehensive safety management system or industrial hygiene program.

•This article presents a model for evaluating susceptible workers, including new and expectant parents, developed by the authors to help OSH professionals evaluate workplace risks and hazards.

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Equal Protection

what to do? Where can an OSH professional seek such information?

Based on a review of common safety and industrial hygiene texts that would be accessible to an OSH professional, relevant guidance on managing the safety and health of susceptible workers (e.g., new or expectant parents) may be insufficient or difficult to understand. For example, the index of *The Safety Professional's Handbook* does not contain the terms *pregnant*, *breastfeeding* or *reproductive*. A few paragraphs can be found about safe levels of chemicals in breast milk of workers, but these comments are hidden in the section on hazard communication. OELs for teratogenic materials are also referenced in the book with a stated goal of minimizing or eliminating any worker exposure. A recommendation from the book was to develop a series of flow charts, including proactive protective measures for susceptible workers (Haight, 2012).

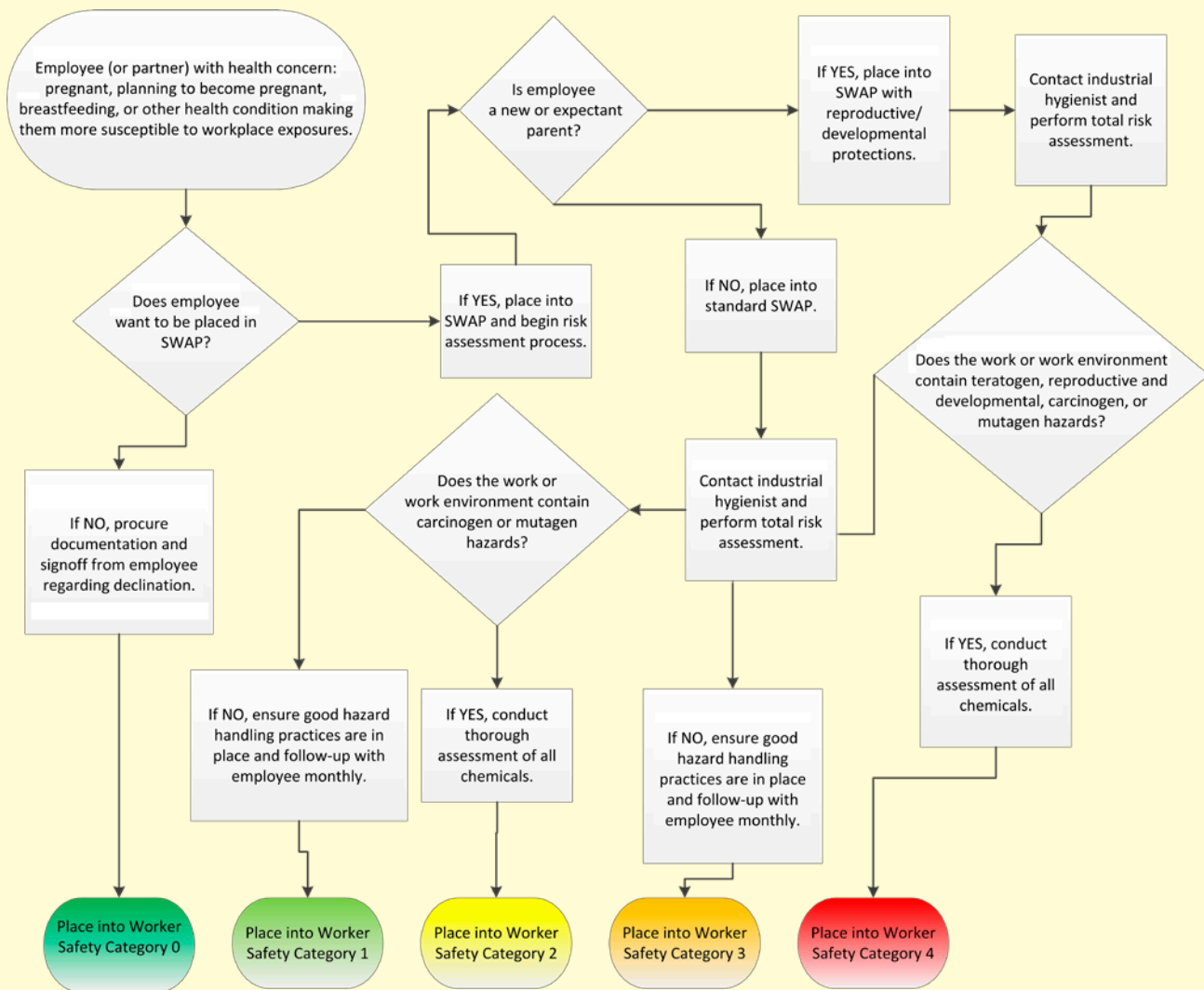
Fundamentals of Industrial Hygiene provides additional guidance, including an acknowledgement that establishing or modifying OELs for pregnant and breastfeeding workers is a difficult task. The text specifically recommends that women who are pregnant or trying to become pregnant should "have their workplace evaluated for potential exposure to teratogenic or fetotoxic exposures" as part of a comprehensive industrial hygiene or safety management system (Plog & Quinlan, 2012).

Where is the peer-reviewed data to support this as a global concern? No recent studies have been performed to evaluate this problem and what may be safe levels of occupational exposure to chemicals. The recent studies are substance- or chemical-specific, adding to the available data or disproving previous data. OSHA, NIOSH, American Conference of Governmental Industrial Hygienists, World Health Organization, International Labor Organization and many other governmental groups recognize reproductive and developmental hazards in the workplace as a growing concern, and acknowledge that data may be unavailable.

A NIOSH website written for workers and dedicated to reproductive health in the workplace explains that many chemicals have not been tested to determine the hazards to reproductive health. NIOSH also states that existing U.S. laws are not



FIGURE 1
Risk Assessment Tool for SWAP



The authors developed the Susceptible Worker Assessment Program (SWAP) model for evaluating special exposure groups such as new and expectant parents.

sufficiently protective for reproductive health or the health of a worker's family. NIOSH seems to place the burden on workers and their healthcare professionals rather than on the employer. The section titled "What Workers Should Know" simply tells workers to ask their organization's OSH professional how to "stay safe" while doing their job, ask for any air monitoring results, and review safety data sheets. In the Section entitled "What Employers Should Know," NIOSH recommends that organizations "make a plan for pregnant and breastfeeding workers" but does not provide any guidance for OSH professionals (NIOSH, 2017).

Substantial information about reproductive toxicants is available in toxicology, occupational health and occupational medicine textbooks, but the focus is primarily on known reproductive toxicants. Much of the available U.S. literature focuses on theory, toxicology and reproductive science, but does not provide concrete, practical methods to

implement necessary elements of gender equal protection in OSH programs.

Risk Assessments for New & Expectant Parents

Risk assessments are an important tool for OSH professionals when evaluating the hazards present for susceptible workers such as new or expectant parents. By definition, a new or expectant mother is "a woman who is pregnant, has given birth within the last 6 months or is breastfeeding" (HSE, 2018). Workplace risk assessments are recommended to consider risks to all susceptible workers, with enhanced focus on risks for new and expectant mothers. A susceptible worker can include a worker who is pregnant or breastfeeding, plans to become pregnant, or has a health condition that makes the person more susceptible to workplace exposures; this can also include a worker whose partner is pregnant, breastfeeding or plans to become pregnant. Risks can include working conditions, and physical,

FIGURE 2

Example Work Safety Categorization of Worker Vulnerability & Job Risk

Work safety category	4	3	2	1	0
Work type	High-risk work with high-, moderate- or low-hazard materials	Moderately high-risk work with moderate- or low-hazard materials	Moderate-risk work with moderate- or low-hazard materials	Low-risk work with moderate- or low-risk materials	Low-risk work with low-hazard materials
Worker example	<i>Those in a SWAP who are pregnant or trying to be pregnant who handle moderate- or high-risk materials</i>	<i>Those in a SWAP who are pregnant or trying to be pregnant who handle low-risk materials</i>	<i>Those in a SWAP who are not pregnant or not trying to be pregnant who handle moderate- or high-risk materials</i>	<i>Those in a SWAP who are not pregnant or not trying to be pregnant who handle low-risk materials</i>	<i>Those not in a SWAP who are not pregnant or not trying to be pregnant who handle low-risk materials</i>
Definitions and abbreviations: Low exposure risk: Wetted dry material handling. Closed systems, ventilation present. Work with compounds that are not teratogens, mutagens, reproductive toxins or carcinogens. <i>Examples:</i> computer-controlled charging of solvent through welded piping connections, transporting samples in sealed containers with an outer bag, handling < 1 L of solvent within a vent hood. Moderate to high exposure risk: Open handling of dry material. Work with compounds that are teratogens, mutagens, reproductive toxins or carcinogens. Handling of material outside of process equipment or controlled systems (e.g., charging and open handling of dry solids, working outside of containment). <i>Examples:</i> scooping dry powder out of drums by hand, open conveyer belts of powder, pouring 55-gallon drums of liquid into open 5-gallon pails.					

chemical, biological and other hazards. Risk assessment is commonly recognized as a fundamental part of job hazard/safety analysis, whereby an OSH professional identifies jobs or tasks with hazards that present an unnecessary risk to the worker, and mitigates or reduces the risk when feasible.

Per ANSI/ASSE Z690.3-2011, Risk Assessment Techniques, risk assessments consist of a three-part process: risk identification, risk analysis and risk evaluation. In risk identification, OSH professionals should anticipate, recognize and record hazards. As part of risk analysis, OSH professionals should apply the data obtained in risk identification to an analysis that helps them understand consequences of the risk, probabilities of the risk and existing controls in place. Through risk evaluation, an OSH professional will compare the risk levels and consider additional controls needed to keep exposures as low as reasonably practicable.

Some entities may not be comfortable conducting risk assessments for new and expectant parents, perhaps because they use a hazards-based or compliance-focused approach, or perhaps due to a lack of knowledge and resources available to OSH professionals. Organizations may also have a “fear of discovering and documenting certain risks that may be difficult to address or mitigate” (Lyon & Hollcroft, 2012). Risk assessments by qualified, trained OSH professionals are needed when risks

pose serious consequences for the worker or the entity, and when control measures are unclear. Workplace exposures to new and expectant parents can pose serious consequences for the mother and the developing fetus, and guidance on control measures is lacking for OSH professionals.

Model for Evaluating Susceptible Worker Populations

Due to the limited guidance from OSHA, NIOSH, ASSE, AIHA and other professional groups about workplace protections for new and expectant parents, the authors developed a model for evaluating special exposure groups such as new and expectant parents. This model, Susceptible Worker Assessment Program (SWAP), is based on the concept of hazard banding, which is also called occupational exposure banding. As recommended by *The Safety Professional’s Handbook*, a model flow chart risk assessment tool was developed for evaluating the risk to susceptible workers, including new and expectant parents.

The SWAP should include an evaluation of the susceptible worker and placement into a specific work safety category based on the specific susceptibility of the worker and the hazards associated with their work tasks. A SWAP is a risk assessment tool specifically designed to protect susceptible workers’ health via hazard banding. Based on the work safety category assigned to the worker, a series of control

Practical methods of implementing inclusive and gender equal protection within OSH programs need to be developed.

methods (following the hierarchy of controls: elimination, substitution, engineering, administrative, protective equipment) is recommended to address the workplace hazards. The control methods recommended to address the hazards may be appropriate regardless of the susceptible workers' inclusion in a SWAP; however, this is for the site-based OSH personnel to determine based on the specific hazards present at the workplace. A susceptible worker can be placed into a standard SWAP if the worker (or his/her partner) is not a new or expectant parent. This is a voluntary program, so any employee, regardless of reproductive status, may be entered into a standard SWAP by request. If the worker (or his/her partner) is a new or expectant parent, the worker can be placed into a SWAP with reproductive and developmental protective elements. Figure 1 (p. 40) shows the risk assessment process in assigning a worker to a particular work safety category. Based on the flowchart, a series of work safety control measures and training are then recommended to decrease the exposure risk for the susceptible worker.

Effective implementation of a SWAP requires communication at all levels of the organization. Detailed, accurate information about specific job hazards, including chemical and physical hazards, must be elevated to a worker's supervisor, primary safety contact (e.g., union safety representative, safety advocate, lead operator, safety coordinator, safety manager), and industrial hygienist or toxicologist, if available. The program must be developed with controlled documents including, but not limited to: worker self-evaluation form, work-specific risk assessments, sign-off forms for communication and worker consent, and detailed plans for continuing hazard evaluations, which can take the form of an industrial hygiene sampling plan. As soon as a worker elects to participate in a SWAP, a chain of events should be initiated, whereby the supervisor and OSH team ensure that a susceptible worker is adequately protected.

Completion of a self-evaluation form by the susceptible worker is the first and most critical step in the process. Part of the self-evaluation form includes a health history questionnaire. This questionnaire should capture basic worker demographic information, relevant medical information, physical job requirements, potential or previous exposures (if known) for that worker, at-risk activities conducted by that worker, control measures, and relevant health history or health concerns. This protected health information provides the baseline risk data for an OSH professional or occupational health provider to begin the SWAP assessment. Occupational health providers issue interpretations and recommendations. The employer's management team must provide the self-evaluation form and any other known information to the OSH team. The purpose is to develop an inclusive exposure profile for the worker so that harmful synergistic effects, such as solvent exposure at home and at work, can be accounted for, along with specific health concerns and vulnerabilities unique to that worker.

A qualified OSH professional can then perform a qualitative risk assessment in which the worker

is placed into an appropriate protection category and a plan is developed to mitigate potential risks. Placing a worker into a protection category should be based on two primary factors: 1) the underlying health concern of the worker; and 2) the relative risk of the work that must be performed. An effective approach to this involves a banding strategy for risk and adding into the banding a consideration for the vulnerability of the worker.

Figure 2 provides a brief example categorization for susceptible workers that considers the vulnerability (e.g., pregnant, trying to become pregnant, breastfeeding, partner who is trying to become pregnant) and job risk based on the category of work conducted by the worker. Figure 2 (p. 41) also provides definitions for low, moderate and high exposure risk work.

For example, a worker who is pregnant or plans to become pregnant will be notified of the ability to be placed in the SWAP. When a female worker elects to participate in the SWAP, a qualified OSH professional conducts a total risk assessment. If the work or work environment has teratogen, mutagen, carcinogen or reproductive/developmental hazards, the worker is placed into Work Safety Category 4. This category can be used for workers who are pregnant or trying to become pregnant who conduct high-risk work with high-, moderate- or low-hazard materials. Similarly, for a male worker working in an area with reproductive or teratogen hazards whose partner is trying to conceive, the male worker can be placed in Work Safety Category 4. Specific control methods for this category can include (not an exhaustive list):

- establishing regulated or designated areas for the use of high-risk materials;
- labeling the process building/area where high-risk materials are used, present or stored;
- labeling the equipment where high-risk materials are used, present or stored;
- handling of high-risk solids or volatiles is only conducted in negative-pressure areas;
- engineering controls such as glove boxes, laminar flow vent hoods, local exhaust ventilation with bell mouth flanges and high efficiency particulate air (HEPA) filtration;
- protective equipment such as supplied air respiratory protection;
- proceduralized decontamination including misting and wiping with sorbent cloths.

Categorizing workers and risk with a banding approach allows OSH programs to provide increasing levels of protection with increasing levels of risk. The control methods for each organization will differ based on the identified hazards. This SWAP model follows industry-wide accepted programs for banding occupational hazards.

After performing proper worker categorization, an OSH professional must ensure that documented actions are taken to address all risks. Special precautions such as limiting access to risk areas, restricting worker tasks to ventilation-protected environments, additional training and labeling high-risk areas are required. The risks of a task and the vulnerability of a worker may require that all work be performed inside of a fume hood or with

a respirator. If the nature of a hazard includes skin sensitization or absorption through the skin, contact with the material must be restricted or effective protective equipment (e.g., chemical protection suit and gloves) must be used. The control strategy must be approved by a qualified OSH professional. First-line supervisors are not generally qualified to perform a thorough hazard assessment for susceptible workers; the SWAP risk assessment process must be conducted by an OSH professional.

Exposure assessment, communication of exposure results and periodic reevaluation are the steps that close the cycle of a SWAP. If exposure monitoring is possible, it must be performed by a qualified industrial hygienist. An exposure sampling plan that considers the risk of each chemical hazard and the potential for exposure should be developed and followed. Exposure monitoring performed without an objective, simply to monitor and gather data, is useless at best, and can be misinterpreted. While concerns may arise about confidentiality and protected health information, it is important to note that the Privacy Rule does not cover employment records, even when the information in an employee's records may be health-related. The Privacy Rule, as part of the Health Insurance Portability and Accountability Act of 1996, does not generally apply to the activities of an employer (DHHS, 2018). This voluntary program is managed by the occupational health provider and the OSH team.

Timely analysis and issuing of reports is critical. Workers must be informed of their personal exposure, and the results of exposure assessments are required to evaluate the effectiveness of a SWAP. Results must be communicated to the worker in a meaningful way. Documentation of the worker's reception of the exposure assessment results is important. If the results show unacceptably high exposure potential, the worker should be moved to the next highest work safety category (e.g., from Work Safety Category 3 to Work Safety Category 4). If already in the most protective work safety category, then the worker must be removed from all work that contains that risk.

Removal of the worker from high-risk work cannot be held against them in any way regarding career performance or promotion. A failure to eliminate or control the hazard rests solely on the employer, not the worker. The final step in the SWAP process is to periodically reevaluate either placement into or removal from a SWAP. This reevaluation should be conducted monthly and requires all available information and input from first-line supervisors, safety professionals, industrial hygienists, occupational health providers and the at-risk worker. The most conservative measure is to keep a worker in a SWAP once s/he has been placed into it until the risk can be eliminated from the workplace.

Conclusion

Workers may express their concerns about reproductive and developmental health effects, prenatal exposure or exposure during breastfeeding to their company's OSH professional. The avail-

able recommendations for risk assessments, OEL modifications and protective equipment provision to susceptible workers (e.g., new or expectant parents) is scattered over many disciplines and can be difficult to understand. Practical methods of implementing inclusive and gender equal protection within OSH programs need to be developed. This has become especially relevant given the number of susceptible workers who continue to work during pregnancy, breastfeeding or other health concerns. This is part of an international conversation about gender equal protection, privacy and reproductive and developmental hazards in the workplace that has been heightened by improved laws relating to pregnancy accommodations and fairness in the workplace. **PS**

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